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⑤④ Method for the preparation of particle board.

⑤⑦ Method for the preparation of a particle board by building up the board in layers with a middle layer of coarse material, a surface layer of fine material on each side of the board and, optionally, one or more intermediate layers between the middle layer and each surface layer, according to which method the material for the surface layer is fractionated and applied with the finest part of the material of the surface layer next to the previous layer which in the board is placed further in and with the coarsest part of the material of the surface layer at the surface of the board and the surface layer on grinding after pressing is ground down to the desired fineness of the material at the surface of the board.

## METHOD FOR THE PREPARATION OF PARTICLE BOARD

The present invention relates to a method for the preparation of a particle board by building up the board in layers with a middle layer of coarse material, a surface layer of fine material on each side of the board and, optionally, one or more intermediate layers between the middle layer and each surface layer.

In the conventional preparation of multi-layer boards according to the principle related above there is either no fractionation of the material within any of the different layers or a stepless fractionation of primarily the material of the surface layer. In both cases a surface of the finished board is obtained which comprises a considerable part of comparatively coarse material. The reason for this in the case when the material of the surface layer is fractionated is that this material on its application is distributed with its coarser parts nearest to the previous layer in the board and with the finest parts of the material at the surface so that the last-mentioned parts are ground off on grinding the board after pressing and hence will be lost. In this way also a great part of the binder which is used for the surface layer will be lost, because the finer the particle material the more binder is absorbed by said material on application of the binder thereto. The presence of coarser particles at the surface of the board gives rise to irregularities on the influence of moisture or solvents owing to the fact that the greater particles will rise more than the finer particles as a result of said influence. This phenomenon appears for instance in the case of thin surface finishings such as when gluing a thin film to the board or when applying lacquer to the board.

An object of the present invention is to provide a method of the above mentioned type, by means of which method a surface of throughout fine material can be obtained.

Another object of the invention is to provide a method of the above mentioned type, by means of which method the consumption of binder for the surface layer can be cut down

and the loss of binder by material ground away can be reduced.

5        These objects are achieved in accordance with the invention by means of a method which is characterized in that the material for the surface layer is fractionated and applied with the finest part of the material of the surface layer next to the previous layer which in the board is placed further in and with the coarsest part of the material of the surface layer at the surface of the board and in that the  
10       surface layer on grinding after pressing is ground down to the desired fineness of the material at the surface of the board.

      The solution of the problem in accordance with the present invention thus implies a break with the conventional  
15       thinking according to which either non-fractionated particle material or fractionated particle material has been applied which latter material without exception has been applied with increasing fineness out towards the surface of the board.

20       In comparison with such prior art methods which are using non-fractionated material for the surface layer, the method according to the invention provides a board with considerably higher volumetric weight and bending strength at the same percentage addition of binder and a considerably lower percentage addition of binder can be used for the attainment of  
25       the same bending strength.

      The fractionation of the material for the surface layer in the method according to the invention is preferably carried out by methods known per se in connection with the  
30       stepless fractionation of particle material but the application of the fractionated material is carried out in reverse order in comparison with the conventional methods for the application of fractionated material, i.e. according to the invention the direction of the blowing in wind sifters is  
35       changed to be the reversed respectively the direction of rotation is changed in case of throwing rolls to be the reversed in comparison with the conventional methods. However,

also a fractionation step-by-step of the material for the surface layer into two or more fractions can be used, if desired.

EXAMPLE

5        Glue-coated particles for the middle and surface layers of a three-layer board were taken from the production in the factory and were pressed to boards having a thickness of 15mm in a laboratory press at 200°C with a pressing time of 7 seconds/mm. The material of the surface layer amounted to  
10        about 35 % by weight calculated on the weight of the total particle material.

      The material for the surface layer was fractionated according to the invention into 2 fractions, one being in the range of 0 - 5 mm and the other above 5 mm. The two fractions  
15        were strewed with the finer fraction next to the material of the middle layer and on both sides thereof and with the coarser fraction farthest out on the two sides of the boards. Two different percentages of glue (11.5 and 7.8 % by weight calculated on the weight of the surface layer) were used,  
20        three boards being pressed at each percentage of glue.

      Two further boards were pressed in the same way but with a material for the surface layer to which there had been added 5 % by weight of non-glued wood dust calculated on the weight of the material for the surface layers; the content  
25        of glue was 11.5 % by weight calculated on the weight of the material for the surface layers.

      Three boards with non-fractionated material for the surface layers and with a content of 11.5 % by weight of glue calculated on the weight of the material for the surface  
30        layers were pressed as controls.

      All boards were ground after the pressing.

      Five samples were taken from each board and examined with respect to the volumetric weight and the bending strength. The results thus obtained are given in the Table below in  
35        the form of mean values obtained for the five samples.

TABLE

	Material for the surface layers	Content of glue of the surface layers % by weight	Volumetric weight kg/m <sup>3</sup>	Bending strength N/mm <sup>2</sup>
5	Not fractionated	11.5	695	15.8
			680	17.0
			672	15.8
	Mean value:		682	16.2
10	Fractionated	11.5	720	21.8
			684	18.4
			699	20.1
	Mean value:		701	20.1
15	Fractionated	7.8	716	20.3
			719	19.0
			719	17.4
	Mean value:		718	18.9
	Fractionated + 5% dust	11.5	691	20.3
			709	19.7
	Mean value:		700	20.0

CLAIM

Method for the preparation of a particle board by building up the board in layers with a middle layer of coarse material, a surface layer of fine material on each side of the board and, optionally, one or more intermediate layers between the middle layer and each surface layer, characterized in that the material for the surface layer is fractionated and applied with the finest part of the material of the surface layer next to the previous layer which in the board is placed further in and with the coarsest part of the material of the surface layer at the surface of the board and in that the surface layer on grinding after pressing is ground down to the desired fineness of the material at the surface of the board.